

REMARKS

Favorable reconsideration of this application is respectfully requested in view of the claim amendments and following remarks. Claims 1-24 are pending in the present application of which claims 1, 13, 23 and 24 are independent. Claims 5, 6, 7, 16, and 24 have been amended. No new matter has been added.

Claims 1, 2, 4, 5, 7-9, 13-19, 21 and 23-24 stand rejected under 35 U.S.C. § 102(a) as allegedly being anticipated by Azuma et al. (U.S. Patent No. 6,477,132) ("Azuma et al."). Claims 3, 6, 10-12, 20 and 22 stand objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the features of the base claim and any intervening claims. The rejection is respectfully traversed for at least the following reasons.

Drawings

The indication that the drawings filed on September 10, 2003 have been accepted is noted with appreciation.

Allowable Subject Matter

The Examiner stated that claims 3, 6, 10-12, 20 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the features of the base claim and any intervening claims. For at least the reasons set forth below, Applicants maintain that independent claims 1 and 13 are allowable over Azuma et al. Because claims 3, 6 and 10-12 depend from, and incorporate all the features of, allowable independent claim 1, and because claims 20 and 22 depend from,

and incorporate all the features of, allowable independent claim 13, Applicants respectfully request withdrawal of the objection.

Claim Rejection under 35 U.S.C. 102

The test for determining if a reference anticipates a claim, for purposes of a rejection under 35 U.S.C. § 102, is whether the reference discloses all the elements of the claimed combination, or the mechanical equivalents thereof functioning in substantially the same way to produce substantially the same results. As noted by the Court of Appeals for the Federal Circuit in *Lindemann Maschinenfabrick GmbH v. American Hoist and Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984), in evaluating the sufficiency of an anticipation rejection under 35 U.S.C. § 102, the Court stated:

Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim.

Therefore, if the cited reference does not disclose each and every element of the claimed invention, then the cited reference fails to anticipate the claimed invention and, thus, the claimed invention is distinguishable over the cited reference.

The Office Action sets forth a rejection of claims 1, 2, 4, 5, 7-9, 13-19, 21 and 23-24 under 35 USC 102(a) as being allegedly anticipated by U.S. Patent No. 6,477,132 to Azuma et al. ("Azuma et al."). This rejection is respectfully traversed.

Azuma et al. discloses a sensing needle 110 and a gate electrode 106 connected to the sensing needle 110 arranged at the end of a cantilever main body 109 (Figure 4; column 10, lines 5-10). Azuma et al. also discloses a field effect transistor (FET) formed at and near the front end of the cantilever main body 109, where the sensing needle 110 and the gate

electrode 106 operate as a gate while n-type Si regions 107, 108 operate respectively as a drain and source (Figure 4; column 10, lines 5-10). Azuma et al. also discloses the sensing needle 203 in Figure 1. In addition, Azuma et al. discloses respective portions 206 and 207 of a thin film adapted to record information as a function of a local change in electric conductivity, and a substrate 208 of an electroconductive metal (Figure 1; column 6, lines 38-54). Reference symbol 206 denotes a low conductivity portion and reference symbol 207 denotes a high conductivity portion of the thin film (column 6, lines 49-54). In addition, Azuma et al. discloses that voltage V_{STM} is applied between the metal substrate 208 and the source S, while voltage V_D is applied between the drain D and the source S (Figure 1).

Claim 1 recites a data storage device comprising "at least one conducting layer wherein a capacitance is formed between the suspension mechanism and the at least one conducting layer" and "a sensor for sensing a change in the capacitance based on a displacement of the probe tip due to the presence of a bit."

Claim 13 recites a method of reading data from a data storage device comprising "providing at least one conducting layer wherein a capacitance is formed between the suspension mechanism and the at least one conducting layer" and "sensing a change in the capacitance based on a displacement of the probe tip due to the presence of a bit."

Claim 23 recites a computer system comprising "at least one conducting layer wherein a capacitance is formed between the suspension mechanism and the at least one conducting layer" and "a sensor for sensing a change in the capacitance based on a displacement of the probe tip due to the presence of a bit."

Claim 24 recites a data storage device comprising "at least one capacitor coupled to the flexible suspension mechanism" and "a sensor for sensing a change in capacitance of the at least one capacitor based on a displacement of the probe tip due to the presence of a bit."

Azuma et al. fails to teach a data storage device comprising "at least one conducting layer wherein a capacitance is formed between the suspension mechanism and the at least one conducting layer" and "a sensor for sensing a change in the capacitance based on a displacement of the probe tip due to the presence of a bit," as recited in independent claim 1. Instead, Azuma et al. discloses that

"When information is recorded...the presence or absence of a recording bit...*is converted into a difference in the electric potential of the electroconductive sensing needle....*The gate voltage of the field effect transistor in the vicinity of the threshold value V_T is fluctuated by that conversion, and the channel between the drain and the source of the field effect transistor is turned ON/OFF or the channel resistance is modulated *depending on the difference in the gate voltage of the transistor* so as to output a binary signal corresponding to the recorded information." (Column 7, lines 23-39) (emphasis added)

Thus, Azuma et al. discloses that the binary signal that is output corresponds to the recorded information as *a function of the difference in the gate voltage* of the field effect transistor (FET). Azuma et al. discloses that the output signal thus depends on the voltage applied to the gate of the FET. The terminals of the FET disclosed by Azuma et al. include the gate G, the drain D and the source S (Figure 1). The voltage applied between the gate and source terminals opens and closes the conductive channel. However, Azuma et al. fails to teach that the FET or any other component operates as a sensor for sensing a change in capacitance between the substrate 208 and the cantilever main body 201. Instead, Azuma et al. discloses a signal corresponding to a difference in gate voltage rather than a sensed capacitance.

The rejection cites column 5, lines 60-61 and paraphrases this passage stating that Azuma et al. discloses "a sensor for sensing a change in the capacitance based on a displacement of the probe tip due to the presence of a bit." However, the rejection appears to be unsupported by the disclosure of Azuma et al. Specifically, the cited passage discusses displacement of a recording medium due to a piezoelectric effect, and not due to displacement of a probe tip due to the presence of a bit. In addition, the FET disclosed by Azuma et al. does not form a capacitance, and does not operate as a sensor to detect or sense a change in capacitance. Instead, the binary signal that is output, as disclosed by Azuma et al., is based on the difference in the gate voltage of the FET, and not on a change in capacitance formed between a suspension mechanism and the at least one conducting layer. In addition, according to Azuma et al., the gate voltage of the FET is modulated *as a function of the change in the electric potential* of the sensing needle, and not as a function of capacitance, in order to output the binary signal according to the recorded information. (see also Column 21, lines 15-20). Furthermore, Azuma et al. fails to teach that the binary signal that is output is detected by a sensor for sensing a change in capacitance based on a displacement of a probe tip due to the presence of a bit. For at least these reasons, Azuma et al. fails to teach "*a sensor for sensing a change in the capacitance based on a displacement of the probe tip due to the presence of a bit,*" as recited in independent claim 1.

The rejection also cites column 6, lines 38-54 and paraphrases this passage stating that Azuma et al. discloses "at least one conducting layer wherein a capacitance is formed between the suspension mechanism and the at least one conducting layer." However, the rejection also appears to be unsupported by the disclosure of Azuma et al. Specifically, Azuma et al. discloses a metal substrate 208, a cantilever main body 201, and a sensing

needle 203 (Figure 1). The cited passage discusses that the sensing needle 203 is connected to an electrode, and that a voltage V_{STM} is applied between the metal substrate 208 and the source S, while a voltage V_D is applied between the drain D and the source S. However, Azuma et al. fails to teach "*wherein a capacitance is formed between*" a suspension mechanism and at least one conducting layer, as recited in independent claim 1. Neither of the voltages V_{STM} and V_D disclosed by Azuma et al. constitute a capacitance formed between a suspension mechanism and at least one conducting layer. Nowhere does Azuma et al. teach that a capacitance is formed between the metal substrate 208 and the cantilever main body 201. For at least these reasons, Azuma et al. fails to teach "at least one conducting layer wherein a capacitance is formed between the suspension mechanism and the at least one conducting layer," as recited in independent claim 1. Therefore, for at least these reasons, Azuma et al. fails to teach all the features of independent claim 1, and withdrawal of the rejection is respectfully requested.

Independent claims 13, 23, and 24 recite similar features as independent claim 1. Specifically, claim 13 recites "providing at least one conducting layer wherein a capacitance is formed between the suspension mechanism and the at least one conducting layer" and "sensing a change in the capacitance based on a displacement of the probe tip due to the presence of a bit." Claim 23 recites "at least one conducting layer wherein a capacitance is formed between the suspension mechanism and the at least one conducting layer" and "a sensor for sensing a change in the capacitance based on a displacement of the probe tip due to the presence of a bit." Claim 24 recites "at least one capacitor coupled to the flexible suspension mechanism" and "a sensor for sensing a change in capacitance of the at least one

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capacitor based on a displacement of the probe tip due to the presence of a bit." Azuma et al. also fails to teach the features of independent claims 13, 23, and 24.

Because claims 2, 4, 5, and 7-9 incorporate all the features of allowable claim 1, and because claims 14-19 and 21 incorporate all the features of allowable claim 13, withdrawal of the rejection is respectfully requested. For at least the reasons set forth above, Azuma et al. does not anticipate the subject matter of claims 1, 2, 4, 5, 7-9, 13-19, 21 and 23-24. Claims 1, 2, 4, 5, 7-9, 13-19, 21 and 23-24 are thus allowable over Azuma et al., and withdrawal of the rejection is respectfully requested.

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Conclusion

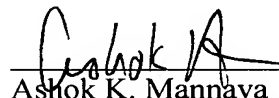
In light of the foregoing, withdrawal of the rejections of record and allowance of this application are earnestly solicited. Should the Examiner believe that a telephone conference with the undersigned would assist in resolving any issues pertaining to the allowability of the above-identified application, please contact the undersigned at the telephone number listed below. Please grant any required extensions of time and charge any fees due in connection with this request to deposit account no. 08-2025.

Respectfully submitted,

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